



Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

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Fax 613 632-5246

**PRELIMINARY ISSUE**

**D5594-1**  
**Job Sheet 186551**

Accounting Job RD17-1048-01



Part No: D5594-1

Job Qty: 25 ea

Part Name: GH Bushing



Part Weight: 0 lbs

Status: New

Job Created: 11/16/18

Job Tracking No:

Due Date: 11/20/18

Created By: Jesse White

Type: R+D

Description:

Note: TBD DWG D5594-1 PRELIM. Rev:B1 IPP Rev.A New Issue 18/06/20 JFS Verified by:DD

Ship Via:

**POSITIVE RECALL**

NOV 19 2018 AUTH 9-89

RELEASED Priority: Medium DATE 11-1-20

220 B  
ECU13-340

### Bill of Materials

### Job Routing

| Op No | Operation          | Qty    | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off |
|-------|--------------------|--------|------------|----------|-----------|---------|-----------------------|-----------|----------|
|       |                    |        |            |          | Setup Hrs | Run Hrs | Workcenter / Supplier | Lead Time |          |
| 90    | Start up Operation | 25 Ea  | 11/20/18   | 11/20/18 | 0.00      | 0.00    | Start Up Machining    |           |          |
| 100   | Doosan             | 25 pcs | 11/20/18   | 11/20/18 | 0.00      | 3.57    | Doosan                |           |          |
| 110   | QC                 | 25 pcs | 11/20/18   | 11/20/18 | 0.00      | 0.00    | QC2                   |           |          |
| 120   | QC                 | 25 pcs | 11/20/18   | 11/20/18 | 0.00      | 0.00    | QC8                   |           |          |
| 130   | Packaging          | 25 pcs | 11/20/18   | 11/20/18 | 0.00      | 0.00    | Packaging3            | 5-177     |          |
| 140   | QC21-SA            | 25 Ea  | 11/20/18   | 11/20/18 | 0.00      | 0.00    | QC21                  |           |          |

Part Op Descriptions: 100 - 1-Turn as per Folio FC152 Rev: \_\_\_\_ & Dwg D5594 Rev: \_\_\_\_ 2-Deburr

21  
9-89

### Job BOM

| Part / Item | Component Name     | Quantity      | Operation             | Container |
|-------------|--------------------|---------------|-----------------------|-----------|
| M304R1.000  | 304 Round Bar 1.00 | 2 ft (.08 ea) | 90-Start up Operation |           |

### Job Allocations

| Operation             | Component Part | Required | Inventory | Allocated |
|-----------------------|----------------|----------|-----------|-----------|
| 90-Start up Operation | M304R1.000     | 2        | 45        | 0         |

### Part Specifications

Specifications could not be found.

Plex 11/16/18 3:34 PM dart.white.jesse



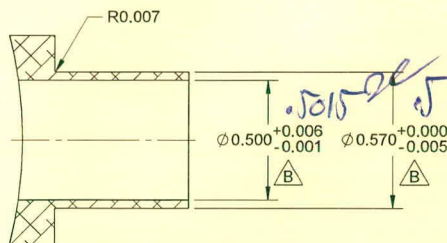
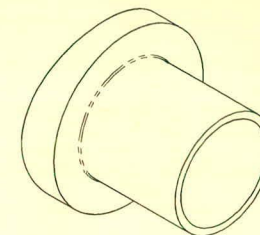
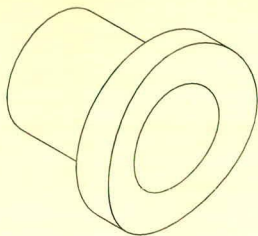
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# WORK ORDER NON-CONFORMANCE / UPDATE

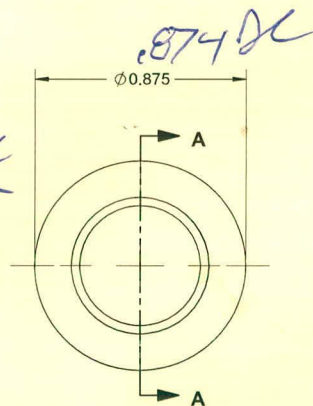
QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

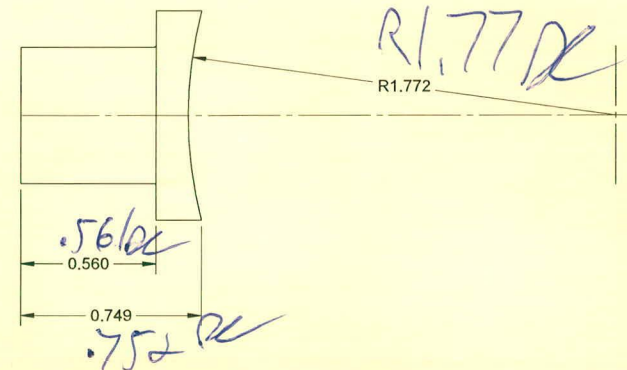
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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                      |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Step #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>MRB (QSI042) Approval</b><br><br><br><b>Completed By</b><br><br><br><b>Lead hand / Supervisor Approval Verification</b><br><br><br><b>QC / QA Coordinator Approval</b> |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <b>Description Work Order Deviation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Disposition</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <b>Root Cause</b><br><br>Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> |  | <input type="checkbox"/> No Re-verification<br><input type="checkbox"/> Operator<br><input type="checkbox"/> Offset/Setup<br><input type="checkbox"/> Supplier<br><input type="checkbox"/> Training<br><input type="checkbox"/> Use for Testing<br><input type="checkbox"/> Poor Information<br><input type="checkbox"/> Rushing<br><input type="checkbox"/> Product Improvement<br><input type="checkbox"/> Process Improvement<br><input type="checkbox"/> Manufacturing Process<br><input type="checkbox"/> Past Due |  | <input type="checkbox"/> Pressure/Forced<br><input type="checkbox"/> Bending<br><input type="checkbox"/> Centre Not Concentric<br><input type="checkbox"/> Cracks<br><input type="checkbox"/> Crimp/Kink/Ripple/Wave<br><input type="checkbox"/> Cuffs<br><input type="checkbox"/> Crushing<br><input type="checkbox"/> Heat Treat<br><input type="checkbox"/> Wave/Twist in Tube<br><input type="checkbox"/> Marks/Chatter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | <b>FAULT CATEGORY</b><br><br><input type="checkbox"/> Temperature/Cure<br><input type="checkbox"/> Set-up<br><input type="checkbox"/> BOM/Route<br><input type="checkbox"/> Broken/Damage/Defect<br><input type="checkbox"/> Inspection Incomplete/Unqualified<br><input type="checkbox"/> Contamination<br><input type="checkbox"/> Countersink<br><input type="checkbox"/> Cut Too Short<br><input type="checkbox"/> Instructions Incomplete/Unclear<br><input type="checkbox"/> Drill Holes |                                                                                                                                                                           | <input type="checkbox"/> Power Loss/Surge<br><input type="checkbox"/> Folio/Program<br><input type="checkbox"/> Grain<br><input type="checkbox"/> Weld<br><input type="checkbox"/> Wrong Stock Pulled<br><input type="checkbox"/> Out of Sequence<br><input type="checkbox"/> Off-set<br><input type="checkbox"/> Mislabeled<br><input type="checkbox"/> Fit/Function<br><input type="checkbox"/> Misaligned/off center |  | <input type="checkbox"/> Positioned Wrong<br><input type="checkbox"/> Outside Dimensions<br><input type="checkbox"/> Over/Under tolerance<br><input type="checkbox"/> Part Incorrect<br><input type="checkbox"/> Part Lost/Missing<br><input type="checkbox"/> Part Moved<br><input type="checkbox"/> Drawing<br><input type="checkbox"/> Finish<br><input type="checkbox"/> Misread<br><input type="checkbox"/> Turning Sequence |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |



**SECTION A-A**



**D5594-1 GH BUSHING**



**NOTES:**

1) MATERIAL: AISI 304/316 STAINLESS STEEL ROUND BAR  
PER ASTM A276  
REF DART SPEC M304R  
OR  
AIS 304/316 STAINLESS STEEL BAR  
PER ASTM A276 OR ASTM A240  
REF DART SPEC M304B

2) FINISH: NONE  
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED  
4) UNITS: INCHES UNLESS OTHERWISE NOTED  
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX  
6) IDENTIFICATION: IDENTIFY PER DART QSI 044 6.7  
7) WEIGHT: 0.03 lbs

**PRELIMINARY ISSUE**

|            |                                                                                     |                                                                                                                                                                                                                                                                          |              |
|------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| B          | 0.570 WAS 0.594, 0.500 WAS 0.516, ADDED TOLERANCES TO THESE DIMS, PER GHW TRIAL FIT | ZF                                                                                                                                                                                                                                                                       | 18.11.15     |
| A          | NEW ISSUE                                                                           | ZF                                                                                                                                                                                                                                                                       | 17.10.31     |
| REV.       | DESCRIPTION                                                                         | BY                                                                                                                                                                                                                                                                       | DATE         |
| DESIGN     | AJS                                                                                 | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                 |              |
| DRAWN      | ZF                                                                                  |                                                                                                                                                                                                                                                                          |              |
| CHECKED    | MW                                                                                  | DRAWING NO.                                                                                                                                                                                                                                                              | REV. B2      |
| MFG. APPR. | DD                                                                                  | D5594                                                                                                                                                                                                                                                                    | SHEET 1 OF 2 |
| APPROVED   |                                                                                     | TITLE                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   |                                                                                     | GH COMPONENTS (EC130)                                                                                                                                                                                                                                                    | NTS          |
| DATE       | 18.11.15                                                                            | COPYRIGHT © 2017 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |

UNAPPROVED

127 6/91 221  
DPA



|                    |        |              |             |
|--------------------|--------|--------------|-------------|
| DART AEROSPACE LTD |        | Work Order:  | 186 SS1     |
| Description:       |        | Part Number: | D5594-1     |
| Inspection Dwg:    | Rev: B |              | Page 1 of 1 |

## INSPECTION SHEET

[illegible]

|              |             |               |
|--------------|-------------|---------------|
| Measured by: | Checked by: | QC Inspector: |
| Date:        | Date:       | Date:         |

|                                                |              |
|------------------------------------------------|--------------|
| <b>Engineering Approval:</b><br>(If necessary) | <b>Date:</b> |
|------------------------------------------------|--------------|

| Rev | Date     | Change    | Revised by | Approved |
|-----|----------|-----------|------------|----------|
| B   | 14.07.31 | New Issue | KJ         |          |

**DART**  
AEROSPACE

Hawkesbury, ON K64 1K7  
CANADA  
TEL.: 1 613 632-5200  
Email: sales@dartaero.com  
www.dartaerospace.com

**Container No: S129352**



**Part: D5594-1**

**Job No: 186551**

**Serial No/Batch: S129352**

**Revision: B1**

**Inspector:**

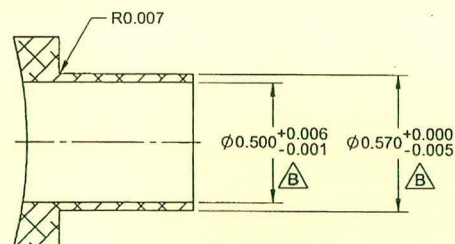
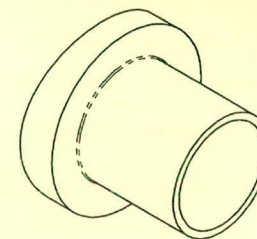
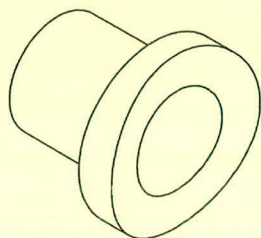
**Exp Date:**

**Instructions:**

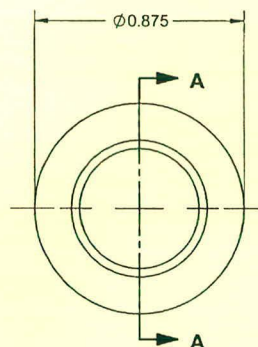
Date: 11/20/18



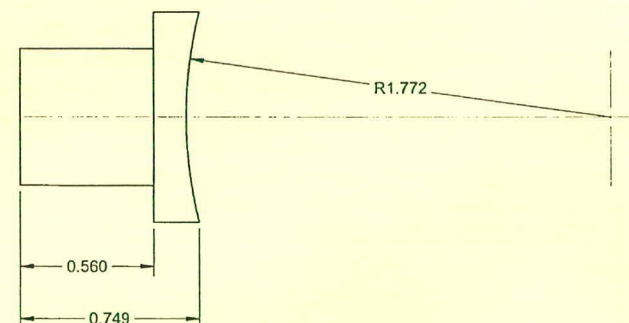
8 7 6 5 4 3 2 1



**SECTION A-A**



**D5594-1 GH BUSHING**



**NOTES:**

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL ROUND BAR  
PER ASTM A276  
REF DART SPEC M304R  
OR  
AISI 304/316 STAINLESS STEEL BAR  
PER ASTM A276 OR ASTM A240  
REF DART SPEC M304B
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER DART QSI 044 6.7
- 7) WEIGHT: 0.03 lbs

**RELEASED**

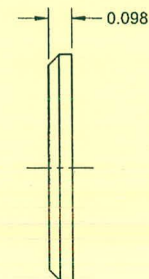
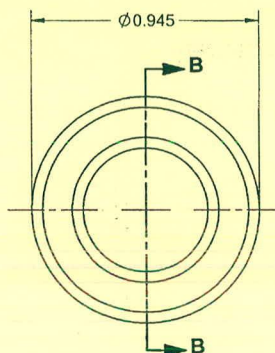
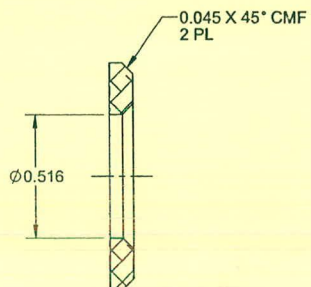
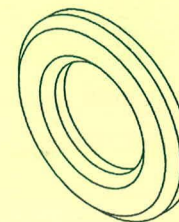
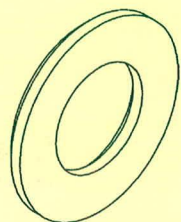
2018 NOV 19  
ECN 16-840

APPROVED

| B          | 0.570 WAS 0.594, 0.500 WAS 0.516, ADDED TOLERANCES TO THESE DIMS, PER GHW TRIAL FIT | ZF                                                                                                                                                                                                                                                                       | 18.11.15     |
|------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| A          | NEW ISSUE                                                                           | ZF                                                                                                                                                                                                                                                                       | 17.10.31     |
| REV.       | DESCRIPTION                                                                         | BY                                                                                                                                                                                                                                                                       | DATE         |
| DESIGN     | AJS                                                                                 | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                 |              |
| DRAWN      | ZF                                                                                  |                                                                                                                                                                                                                                                                          |              |
| CHECKED    | MW                                                                                  | DRAWING NO.                                                                                                                                                                                                                                                              | REV. B       |
| MFG. APPR. | DD                                                                                  | D5594                                                                                                                                                                                                                                                                    | SHEET 1 OF 2 |
| APPROVED   | NO                                                                                  | TITLE                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | CP                                                                                  | GH COMPONENTS (EC130)                                                                                                                                                                                                                                                    | NTS          |
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8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



**SECTION B-B**

**D5594-3 GH WASHER**

**NOTES:**

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL ROUND BAR  
PER ASTM A276  
REF DART SPEC M304R  
OR  
AISI 304/316 STAINLESS STEEL BAR  
PER ASTM A276 OR ASTM A240  
REF DART SPEC M304B
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER DART QSI 044 6.7
- 7) WEIGHT: 0.01 lbs

RELEASED  
2010 NOV 19

APPROVED

|            |          |                                                                                                                                                                                                                                                                                                  |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AJS      | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                         |              |
| DRAWN      | ZF       |                                                                                                                                                                                                                                                                                                  |              |
| CHECKED    | MW       | DRAWING NO.                                                                                                                                                                                                                                                                                      | REV. B       |
| MFG. APPR. | DD       | <b>D5594</b>                                                                                                                                                                                                                                                                                     | SHEET 2 OF 2 |
| APPROVED   | NO       | TITLE                                                                                                                                                                                                                                                                                            | SCALE        |
| DE APPR.   | CP       | <b>GH COMPONENTS (EC130)</b>                                                                                                                                                                                                                                                                     | NTS          |
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8 7 6 5 4 3 2 1